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10/510,338	04/05/2005	Anders Granstrom	2380-984	8347

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EXAMINER	
PATEL, DHAVAL V	
ART UNIT	PAPER NUMBER
2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,338	GRANSTROM ET AL.	
	Examiner	Art Unit	
	DHAVAL PATEL	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-39(claim 15 is cancelled)* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,12-14,16,18,21 and 34* is/are rejected.

7)☒ Claim(s) *10-11,17,19-20, 22-33 and 35-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Examiner has acknowledged amended claims 1-14 and 16-33 and also newly added claims 34-39.

2. Applicant's arguments with respect to claim have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***
>
> a. Determining the scope and contents of the prior art;
> b. Ascertaining the differences between the prior art and the claims in issue;
> c. Resolving the level of ordinary skill in the pertinent art; and
> d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

4. **Claims 1-9, 12-14, 16, 18, 21 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heidman et al. (US 6,799,020) (hereafter Heidman) in**

view of Daly et al. (US 6,748,021) (hereafter Daly) and further in view of Moon et al. (US 7,184,448) (hereafter Moon).

Regarding claims 1 and 14, Heidman discloses transmitter method and arrangement, comprising:

a first modulation unit (Fig. 1a, 126A) having a first digital signal processor (Fig. 1a, digital gain, 106a, col. 4 lines 51-56 discloses performing gain function in digital signal processors) and a first analogue signal generator (Fig. 1a, digital to analog converter, 108A);

said first digital signal processor (Fig 106a) having a first digital signal input (Fig. 1a, digital input from 102A)

a first power amplifier (Fig. 1a, HPA, 112a), connected to an output of said first analogue signal generator (Fig. 1a, DAC, 108A)

a second modulation unit (Fig. 1a, second modulation through second branch) having a second digital signal processor (Fig. 1a, digital gain, 106b) and a second analogue signal generator (Fig. 1a, DAC, 108b)

said second digital signal processor (Fig. 1a, digital gain, 106a) having a second digital signal input (Fig. 1a, digital input through 102b)

a second power amplifier (Fig. 1a, HPA, 112b) connected to an output of said second analogue signal generator (Fig. 1a, DAC, 108b)

combiner device (Fig. 1a, combiner, 120) connected to outputs of said first (Fig. 1a, power amplifier, 112a) and second power amplifiers (Fig. 1a, power amplifier, 112b)

and transmitter device (Fig. 1a, transmitting antenna, 122) connected to an output of said combiner device (Fig. 1a, combiner, 120)

However, Heidman is silent about

(1) said first digital signal processor further comprises : at least one first non-constant envelope modulation means; a first signal component separator connected to an output of said at least one first non-constant envelope modulation means; a first output of said first signal component separator being connectable to said first analogue signal generator; first means for receiving modulation instructions; at least one first constant envelope modulation means connectable to said first analogue signal generator; and first modulation selecting means for connecting a modulation means to said first digital signal input -in response to received modulation instructions; and

(2) said first modulation selecting means being operable on a time slot basis.

Regarding item (1) above,

in the same field of endeavor, Daly teaches at least one non-constant envelope modulation means (Fig. 10, QPSK), Also, Daly teaches within the same section (108) the signal separation into the in phase (I) and Quadrature (Q) components. Daly further teaches modulation selection signal (construed as control signal) to select the modulation scheme like QPSK (112), 16QAM (110) and GMSK (114) (QPSK is non-constant envelope signal while GMSK is constant envelope signal) using the switch (116a). Digital to analog converter is the inherent component of the wireless communication where digital signal is modulated signal and converted into analog form

before transmitted through transmitting antennas, so the means for converting the digital to analog signal must be there.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such components for selecting the modulation schemes, as taught by Daly, into the system of Heidman, as a whole, so as to choose (based upon modulation selection instruction) the modulation scheme either from non constant envelope or constant envelope for processing the digital signal and separating the modulated signal into the in phase and quadrature phase components, the motivation is to provide an improved communication system which uses adaptive modulation and optimized the data rates (col. 2 lines 59-62).

Regarding item (2) above,

In the same field of endeavor, moon teaches each time slot is individually modulated with modulation specific modulation scheme. Furthermore, one of the modulation schems is assigned to each time slot by predetermining a time slot specifi modulation scheme for all time slots (col. 3 lines 17-35). Furthermore, based on reception signal, modulation scheme is selected (col. 4 lines 48-57).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine teachings of moon, into the system of both Heidman and Daly, as a whole, so as to select modulation method on a time slot basis, the motivation is to adaptive modulation (col. 1 lines 62-66).

Regarding claim 2, the combined teachings of both Heidman and Daly discloses same limitations since Daly's method to select modulation and separate into in phase and quadrate phase components can be used in Heidman's transmitter arrangements with multiple parallel processors and digital to analog converters and power amplifiers. Furthermore, Heidman discloses combining or summing the signal from multiple processors (Fig. 1a, combiner, 120).

Regarding claim 3, the combined teachings of both Heidman and Daly discloses the transmitter arrangement wherein a second output of said first signal component separator (Daly, Fig. 10,quadrature phase component, 108) being connectable to said second analogue signal generator (Heidman, Fig. 1a, 108B).

Regarding claim 4, claim is rejected on the same basis for claim 1 is rejected. Claim 4 is similar except refer to second digital signal processor and the combined teachings of both Heidman and Daly already established that the Daly's modulation selecting means after receiving control instructions can be used into the transmitter arrangement of Heidman with multiple parallel processes and combining.

Regarding claim 5, as described in claim 1, since, both modulation unit have selecting means, modulation method selection scheme is based on time slot basis, as

taught by moon, will be applied to combined teachings of both Haidman and Daly. refer to claim 1 rejections.

Regarding claims 6, Heiman further discloses the transmitter arrangement further comprising: first power monitor sensing (Fig. 1a, power meter, 118) a total power to said transmitter device (Fig. 1a, 126) or a quantity directly related thereto; and phase-shifter (Fig. 1a, DDS, 104a) connected to said first power monitor (Fig. 1a, power control module, 116), arranged for causing a phase shift of an analogue signal generated by said first analogue signal generator (Fig. 1a, DAC, 108a) in response to said sensed total power (Fig. 1a, power meter, 118 sense total power from combiner (120)).

Regarding claim 7, Heiman further discloses the transmitter arrangement according to claim 6, wherein said first power monitor (Fig. 1a, control module, 116) is a power meter (Fig. 1a, power meter, 118) of a load of said combiner device (Fig. 1a, combiner, 120).

Regarding claim 8, Heidman further discloses the transmitter arrangement wherein said phase-shifter (Fig. 1a, 102a controlled by digital synthesizer, 104a) comprises means for complex multiplication of said phase shift (Fig. 1a, 104a) with a digital signal to be inputted to said analogue signal generator (Fig. 1a, DAC, 108a).

Regarding claim 9, the combined teachings of Heidman and Daly teach this limitation because Heidman does teach measuring combined power and adjust the phase and amplitude of the input signals to adjust power (abstract and Fig. 1a). Furthermore, Daly teaches different modulation transmission selecting GMSK modulation scheme (Fig. 11 and Fig. 12).

Regarding claim 12, Heidman discloses the transmitter arrangement according to claim 1, means for combination of at least two carriers (Fig. 1a, combiner 120), However, Heidman is silent about the method wherein that said first and second non-constant envelope modulation means are selected from the list of: 4-PSK modulation means; 8-PSK modulation means; and means for combination of at least two carriers.

However, one skilled in the art would know that there are various type of modulation types within which PSK modulation has different modulation schemes like 4-PSK, 8-PSK etc.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to select the PSK modulation from either 4-PSK or 8-PSK modulation scheme, so as to transmit more bits per symbol, in order to achieve higher data rate.

Regarding claim 13, Heidman is silent about the transmitter arrangement wherein said first and second constant envelope modulation means are GMSK modulation means.

However, Daly, in the same field of endeavor, teaches GMSK modulation means as one of the selecting means (Fig. 10, GMSK, 114)

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine teachings of both Heidman and Daly, as a whole, so as to use GMSK as constant envelope modulation, to provide higher data rates.

Regarding claim 16, claim 16 is rejected on the same basis claims 1 and 2 are rejected.

Regarding claim 18, Moon further discloses the method wherein said non-constant envelope modulation is a 8-PSK modulation (col. 1 lines 20-30).

Regarding claim 21, Heidman further discloses the method, comprising the further acts of: monitoring a power of said analogue transmitter signal or a quantity directly related thereto (Fig. 1a, power meter); and shifting a phase of said first output signal according to said power (Fig. 1a describes adjusting or controlling amplitude and phase to adjust power).

Regarding claim 34, Heidman discloses a transmitter unit, comprising:

a first modulation unit (Fig 1a, 126) configured to receive a first digital signal (Fig. 1a, 102a) and a first modulation selection signal(Heidman does not explicitly disclose but would be obvious as explained below); and configured to output a first radio frequency signal (Fig. 1a, output from 106a) corresponding to the first digital signal (Fig. 1a, 108a, DAC) modulated according to the first modulation selection signal (Heidman does not explicitly disclose but would be obvious as explained below);

a second modulation unit (Fig. 1a, 126) configured to receive a second digital signal (Fig. 1a, 102b) and a second modulation selection signal(Heidman does not explicitly disclose but would be obvious as explained below); and configured to output a second radio frequency signal (fig. 1a, second output, 106b)corresponding to the second digital signal (Fig. 1a, DAC) modulated according to the second modulation selection signal (Heidman does not explicitly disclose but would be obvious as explained below);

a first power amplifier operatively connected to the first modulation unit and configured to amplify the first radio frequency signal (Fig. 1a, HPA, 112a, and 102a, and 106a are first modulation unit);

a second power amplifier operatively connected to the second, modulation unit and configured to amplify the second radio frequency signal (Fig. 1a, HPA, 112b and 102b and 106b are second modulation unit);

a combiner (Fig. 1a, combiner, 120) operatively connected to the first and second power amplifiers (Fig. 1, 112a, and 112b) and configured to combine the first and second radio frequency signals and output the combined radio frequency signals to a radio transmitter (Fig. 1a, transmitting antennas); and.

a power meter (fig. 1a, power meter, 118) configured to measure a power level of the combined radio frequency signals from the combiner (Fig. 1a, combiner 120),

However, Heidman does not explicitly disclose:

(1) first modulation unit to receiver first modulation selection signal and output digital signal according to first modulation selection signal and same for second modulation unit.

(2) wherein the first and second modulation units are each operable to apply a modulation scheme according to the first and second modulation selection signal, respectively, on a time slot basis.

Regarding item (1) above,

in the same field of endeavor, Daly teaches at least one non-constant envelope modulation means (Fig. 10, QPSK), Also, Daly teaches within the same section (108) the signal separation into the in phase (I) and Quadrature (Q) components. Daly further teaches modulation selection signal (construed as control signal) to select the modulation scheme like QPSK (112), 16QAM (110) and GMSK (114) (QPSK is non-constant envelope signal while GMSK is constant envelope signal) using the switch (116a). Digital to analog converter is the inherent component of the wireless

communication where digital signal is modulated signal and converted into analog form before transmitted through transmitting antennas, so the means for converting the digital to analog signal must be there.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such components for selecting the modulation schemes, as taught by Daly, into the system of Heidman, as a whole, so as to choose (based upon modulation selection instruction) the modulation scheme either from non constant envelope or constant envelope for processing the digital signal and separating the modulated signal into the in phase and quadrature phase components, the motivation is to provide an improved communication system which uses adaptive modulation and optimized the data rates (col. 2 lines 59-62).

Regarding item (2) above,

In the same field of endeavor, moon teaches each time slot is individually modulated with modulation specific modulation scheme. Furthermore, one of the modulation schemes is assigned to each time slot by predetermining a time slot specific modulation scheme for all time slots (col. 3 lines 17-35). Furthermore, based on reception signal, modulation scheme is selected (col. 4 lines 48-57).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine teachings of moon, into the system of both Heidman and Daly, as a whole, so as to select modulation method on a time slot basis, the motivation is to adaptive modulation (col. 1 lines 62-66).

Allowable Subject Matter

5. Claims 10, 11, 17, 19-20, 22-33, 35-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patel Dhaval whose telephone number is (571) 270-1818. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Dhaval Patel/
Patent Examiner of Art Unit 2611
5/1/2008

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611